4.1.00   Overview[1]

Analyzing and determining appropriate mitigation for development impacts is the primary role of the Development Services section.

Chapter 3 examines the SEPA process and explains why SEPA is the main legal basis, requiring WSDOT review of and comment on land-use proposals. It also briefly describes what constitutes a probable significant adverse environmental impact from a general viewpoint; and that there must be a nexus between the development impacts and the required mitigation which must be reasonable and proportionate to those impacts.

Part 1 of this chapter, titled "Thresholds for Determining Probable Significant Adverse Impacts," discusses in detail how to determine what constitutes a probable significant adverse impact to the State Transportation System. Minimum vehicular volume thresholds are discussed, as well as minimum Level of Service (LOS) thresholds. In addition, other factors are discussed such as traffic impacts to a High Accident Location (HAL) and/or a High Accident Corridor (HAC).

Part 2 of this chapter, titled "Determining the Mitigation for a Probable Significant Adverse Impact," discusses in detail how to determine what type of mitigation is warranted, if any, and whether it should be a traffic mitigation payment to a WSDOT project; construction of a developer-funded highway improvement; or a property donation/dedication for right of way, etc.

Part 3 of this chapter, titled "Traffic Impact Analysis," is a detailed discussion of what a typical Traffic Impact Analysis (TIA) must include.

PART 1   Thresholds for Determining Probable Significant Adverse Impacts[2]

4.1.01   Determining Probable Significant Adverse Impacts Is Not Easy

Determining probable significant adverse impacts to the state highway system can be difficult, both analytically and sometimes politically. Determining what constitutes a probable significant adverse impact can be as simple as consulting the WSDOT Design Manual for left- or right-turn channelization warrants, or as complicated as system modeling and signal synchronizing analyses. Other factors to be considered may include: number of lanes, topography, functional class, access control criteria, traffic signal spacing, and accident history.

It can be difficult for the WSDOT to achieve consensus with the developer and the local agency in the determination of a fair and reasonable mitigation plan.

For instance, a large development next to a major freeway may have little or no impacts to the state highway system while that same development next to a two-lane state highway is likely to have significant adverse traffic impacts. It may be difficult to convince some local agencies that traffic improvements are needed when they are making a concerted effort to bring in new development. A local agency may see a WSDOT request for mitigation as a deal-breaker that will prevent the developer from locating within its taxing jurisdiction. This can make it difficult for the WSDOT to obtain the needed highway improvement.

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[1]   It is important to remember WSDOT is authorized to directly require mitigation when it is the agency issuing a permit, such as Access Permits (see Chapter 6); however, when a local agency is the permitting authority, it, and not WSDOT, has the sole authority to require developer mitigation. Also refer to Chapter 5, Part 3, Interlocal Agreements.

[2]   Interlocal agreements between WSDOT and Local Agencies may supercede some Threshold criteria. See

4.1.02 Documentation is Critical

As discussed in the SEPA section of Chapter 3, a probable significant adverse impact can be a subjective determination. The WSDOT may not agree with the methodologies and assumptions used in a developer's Traffic Impact Analysis (TIA). This can be a source of conflict, especially if the TIA, prepared by a Professional Engineer, concludes that a development will not result in significant adverse impacts. Therefore, it is important to have well-reasoned and documented support for decisions that are made. This is especially important when the WSDOT determines that a probable significant adverse impact will occur while the developer's TIA says otherwise.

If both sides disagree, then the ultimate determination is made by the SEPA lead agency after a hearing. A well-documented presentation of WSDOT's engineering decisions is critical to influencing the decision of the hearings examiner or other decision maker. Merely presenting good ideas is not good enough. Engineering decisions and recommendations must be based on department policy, which must be supported by well-documented, consistent practices, such as use of the WSDOT Design Manual, Highway Capacity Manual, adopted WSDOT deficiency thresholds and other professionally credible sources.

When WSDOT requests mitigation for a development's impacts, it is important to adequately tie the requested mitigation to the proposal's impacts. WSDOT must show that the development's impacts are directly related to the requested mitigation measures. In addition, the WSDOT must show the requested mitigation is roughly proportional to the development's impacts.

4.1.03 Determining a Probable Significant Adverse Impact

"Significant Adverse Impact," as used in SEPA, means "a reasonable likelihood of more than a moderate adverse impact on environmental quality."[3] This applies to the development's physical setting, and both the magnitude and duration of the impact. What is considered significant will vary from one site to another because of local sensitivities to certain conditions surrounding a site; "significant" also will vary from one jurisdiction to another because of the subjective judgment of the "responsible official" for the SEPA lead agency.

Determining what constitutes "a reasonable likelihood of more than a moderate adverse impact," i.e., a probable significant adverse impact is easier if predetermined thresholds or other published standards are used. Almost all traffic impact mitigations that are required as a result of WSDOT requests are based on published deficiency and/or impact thresholds/standards.

4.1.04 Thresholds For Defining A Probable Significant Adverse Impact

One of the most effective and defensible ways for the WSDOT to determine a probable significant adverse impact is the application of established deficiency or impact thresholds. The thresholds relate to measurable characteristics of transportation facilities, such as traffic volumes. The following categories of WSDOT deficiency/impact thresholds may be used when reviewing land-use proposals:

• Vehicular Trip Thresholds

• Level of Service (LOS) Thresholds

• Channelization Thresholds

• Safety HAL and HAC Thresholds

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[3] WAC 197-11-794 (1)

4.1.05   *Vehicular Trip Thresholds*

WSDOT will typically request that mitigation take the form of either construction of a highway improvement (which often includes the donation/dedication of property for right of way purposes) or contribution of a traffic mitigation payment to a programmed (funded or nearly funded) WSDOT project. On some occasions WSDOT may request both.

WSDOT will consider any development that meets or exceeds either or both of the following vehicular trip criteria to have a probable significant adverse impact to the state highway system.

- Fee-based mitigation: Addition of ten (10)[4] or more AM or PM peak-hour vehicle trips to any state highway intersection or segment of state highway for the purpose of determining whether a traffic mitigation payment (pro-rata share) to a planned and/or programmed WSDOT project should be requested.

- Non fee-based mitigation: Addition of twenty five (25)[4] or more AM or PM peak-hour vehicle trips to any state highway intersection or access connection for the purpose of determining whether a developer funded, designed, and constructed highway improvement should be requested.

4.1.06   *Level of Service (LOS) Thresholds*

The most common standard for determining traffic impacts on highways is the nationally recognized "Level of Service" (LOS) criterion as defined by the Highway Capacity Manual published by the Transportation Research Board. It is essentially a grading system ranging from A (best) to F (worst) that qualitatively signifies the relative congestion on a highway segment given traffic volume, vehicle mix, roadway geometry, and intersection characteristics. When a development would degrade a highway's LOS below the applicable threshold, the highway segment or intersection would be considered deficient to support the development, and WSDOT and its partners would seek mitigation of the traffic impacts.

The WSDOT will consider any development that exceeds (i.e. degrades) the following Level of Service (LOS) levels as having a probable significant adverse impact to the state highway system. These thresholds are established in the WSDOT *Highway System Plan*.

For Highways of Statewide Significance (HSS):

- Urban Areas: LOS "D"

- Rural Areas: LOS "C"

For Regionally Significant State Highways (non-HSS):

- The LOS thresholds adopted by the local MPO/RTPO shall apply. See Appendix 29. In the absence of an adopted LOS threshold, the LOS for HSS shall apply. Where there is a specific Interlocal Agreement with WSDOT, the applicable LOS threshold levels as established by the agreement shall apply.

Determination of whether a state highway segment is in an urban or rural area may be made by use of the WSDOT State Highway Log listing of functional class—rural or urban—for a given section of highway.

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4   In some instances, a region may choose to usa a different threshold. If the threshold is changed, the region must document its justification; i.e. through Interlocal Agreements with local agencies. The threshold may be a region-wide policy or may be applied only to specific routes or geographic areas.

When a development affects a highway segment or intersection where the LOS is already below the applicable threshold, then the pre-development LOS is the condition that must be preserved. The time delay associated with the pre-development LOS is used rather than the otherwise applicable deficiency level. For example: If the pre-development and post-development LOS at an intersection is F, with the time delay of 80 and 95 seconds respectively, then the appropriate mitigation is to make the necessary highway improvements to bring the time delay back to 80 seconds or less.

The LOS thresholds apply to intersections. The bases for evaluating LOS are the methodologies defined in the most recent version of the Highway Capacity Manual.

4.1.07   WSDOT Channelization Thresholds

Addition of twenty five (25) or more AM or PM Peak-hour vehicular trips to an intersection or access connection that meets or exceeds the WSDOT Design Manual criteria for channelization will be considered a probable significant adverse impact.

WSDOT Design Manual Chapter 910.07 discusses channelization criteria for left-turn lanes, right-turn lanes and pockets and two-way left-turn lanes (TWLTL). Development Services staff should consider mitigation in the form of a developer constructed intersection improvement.

4.1.08   Safety Thresholds

High Accident Locations and High Accident Corridors (HAL & HAC)

Addition of ten (10) or more AM or PM peak-hour vehicular trips to a High Accident Location (HAL) or High Accident Corridor (HAC) will be considered a probable significant adverse impact.

The WSDOT primarily uses two accident analysis methodologies to identify safety deficiencies on state highways. These are the High Accident Location (HAL) and the High Accident Corridor (HAC) programs. The regions use the HAL and HAC lists to prioritize safety improvement projects in developing their construction programs. The WSDOT Headquarters Traffic Data Office produces HAL and HAC logbooks biannually.

When a development proposal impacts a HAL or a HAC, WSDOT may require reasonable mitigation even if the LOS thresholds are not exceeded or the WSDOT Design Manual channelization warrants are not met. Mitigation may take the form of developer-constructed improvements or traffic mitigation payment to a state project if one is programmed for the HAL/HAC location. Regional Development Services staff should coordinate with Regional Traffic and Program Management staff to create a list of HAL and HAC projects from the biennial logbooks with reasonable solutions and cost estimates for improvements that would mitigate the deficiencies. This project list could provide the basis for mitigation assessments for development impacts.

Other Safety Thresholds

In addition to the minimum safety thresholds mentioned above, the WSDOT may consider other safety threshold requirements. Safety must always be considered when assessing traffic impacts. Sight distance is a critical criterion. Turning movements are also a prime safety concern. While a TIA may conclude that the traffic impacts to a state highway will not exceed LOS thresholds or meet WSDOT Design Manual channelization warrants, the WSDOT Region Traffic Engineer may still request reasonable intersection improvements based on safety deficiencies.

If the Region Traffic Engineer does request a mitigation improvement that does not otherwise meet the thresholds listed in this Chapter, then the Region Traffic Engineer must document the engineering basis and analyses for the improvement in an engineering study or other report that clearly justifies the reasons for requesting the mitigation improvement.

PART 2   Determining the Mitigation for a Probable Significant Adverse Impact

4.2.01   Obtaining Mitigation from a Developer

Mitigation for traffic impacts is usually provided through one of two methods:

- Traffic Mitigation Payment to a Planned and/or programmed WSDOT project, and/or
- Developer Constructed Highway Improvement (Developer Agreement)

Mitigation also may take the form of a dedication/donation of property to the WSDOT for right of way; provision of an easement such as a slope or drainage easement; or developer mitigation credits.

4.2.02   Traffic Mitigation Payment

A traffic mitigation payment is a monetary contribution by a developer to a planned and/or programmed WSDOT project.

Often a development's traffic impacts will affect a section of the state highway that is already programmed for improvement by WSDOT. In such cases, the WSDOT may choose to have the developer mitigate its traffic impact by contributing monetarily towards the cost of the WSDOT project on a proportionate share basis. Such payments also are known as "pro-rata" or "fair-share" payments.

4.2.03   Which WSDOT Projects are Candidates for a Traffic Mitigation Payment?

SEPA allows for the collection of a traffic mitigation payment if the payment will go toward a project that will mitigate the probable significant adverse impacts of the land use proposal. The project candidate must be:

(a)   A mobility project that is included in the CIPP, such as two-lane to four-lane highway widening projects, or,

(b)   A safety project, or,

(c)   A signalization project that is listed in the Signal Priority Array.

Preservation projects, such as asphalt overlay projects, do not normally qualify since the project does not add capacity to the highway or an intersection; thus, they do not mitigate the traffic impacts of a land use proposal.

The WSDOT typically will not seek a traffic mitigation payment contribution toward Mega projects or other major regional projects such as the second Tacoma Narrows Bridge, I-405 widening, or the addition of freeway HOV lanes. WSDOT will consider developer-funded modifications to these types of highway projects if a land use proposal warrants changes to the projects. For example, a land use proposal may warrant additional intersection improvements, such as more turn lanes and/or a traffic signal; more lanes on a freeway on- or off-ramp; or other highway improvements beyond what is funded in the WSDOT project.

Some large land use proposals, such as a regional shopping mall or huge housing development, will warrant stand-alone improvements, such as a new freeway interchange. Such improvements are typically funded entirely by the developer.

It is recommended that each region prepare a list of those WSDOT projects that qualify for receiving traffic mitigation payments. It also is recommended that the per-vehicle traffic mitigation payment be determined in advance for each project. This is similar to what is done for interlocal agreements[5]. Predetermination of traffic mitigation payments streamlines the development review process for WSDOT and local agency staff and helps developers determine the total costs of development.

4.2.04 Which WSDOT Project Costs Should Be Used?

Usually, the WSDOT project cost will include design, right-of-way, and construction costs. Unless required otherwise by a local agency or in a SEPA hearing, only the State funded portion of the project cost is eligible for assessment of a traffic mitigation payment. Federal and local funds are exempt in calculating project costs. The local agency may also be collecting its own traffic mitigation payment. These funds may be applied to the local agency's contribution to the WSDOT project. Therefore the local agency contribution to the project costs also must be exempt in calculating project costs.

Note: SEPA specifically precludes the duplication of impact fees; therefore, it is important to make sure that the WSDOT's and local agency's impact assessments do not overlap.

4.2.05 How are Traffic Mitigation Payments Collected by the WSDOT?

Traffic mitigation payments are usually collected by one of two means. They are:

- Mitigation Agreement, or
- Local Mitigation Agreement (LM Agreement).

Mitigation Agreement: A Mitigation Agreement is a two party agreement between a developer and the WSDOT in which the developer agrees to contribute a predetermined monetary amount directly to the WSDOT. The amount to be collected is usually determined during the SEPA review stage of the project.

Local Mitigation (LM) Agreement: A Local Mitigation Agreement (LM Agreement) is a two party agreement between a Local Agency and the WSDOT. It is used to transfer developer funds collected by the local agency for traffic impacts to the WSDOT. The LM Agreement may have numerous developers listed on it, provided that all funds collected and transferred are going exclusively to the WSDOT project(s) specified in the agreement.

4.2.06 Time Limits on Collection of Traffic Mitigation Payments

In most cases WSDOT will stop requesting SEPA-conditioned traffic mitigation payments upon the Award of the WSDOT project for which the payment was requested.

However, on some bigger projects where construction will occur over an extended length of time, it may be appropriate to request mitigation payments throughout the project's construction phase up to the "Substantial Completion Date." In those cases it is desirable to request the mitigation payment on a sliding or proportionate scale. This method assesses traffic mitigation costs against 100 percent of the project costs at the award date of the project, diminishing to zero at the anticipated completion date of the project

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[5]   Refer to Chapter 5, Part 3, and Appendix 11.

(Substantial Completion Date). Some local agencies will only agree to a sliding scale if the original assessment proportionality will not change even if construction delays occur, and the project lasts longer than anticipated.

4.2.07 *When Should a Traffic Mitigation Payment be Collected?*

Normally, during SEPA review, WSDOT will request that the traffic mitigation payment is collected at Final Plat approval or at issuance of the building permit. In some cases, payment of the traffic mitigation funds may be a condition of issuance of the occupancy permit, but it is more desirable to tie the payment to the building permit.

4.2.08 *Consistency is Important*

Statewide experience with local agencies shows that there is no standard formula for assessing and collecting traffic mitigation payments. Formulas may be based on peak hour traffic or Average Daily Traffic (ADT's). They may be based on existing traffic volumes or projected traffic at a future design year. Formulas also may be based on the criteria and thresholds of an area's metropolitan transportation plan.

Therefore, it is important that the WSDOT is uniform and consistent statewide on how it determines a traffic mitigation payment. Unless there is an interlocal agreement that specifies another methodology or formula for determining the mitigation payment, then the following assessment methods should be used to determine a traffic mitigation payment.

4.2.09 *How to Calculate an Intersection Traffic Mitigation Payment*

Once a decision has been made to collect Traffic Mitigation Payments for a particular WSDOT intersection project, the next step is to determine what that payment should be. As mentioned in previous sections, determining a reasonable and proportionate amount is critical to the success of the request.

Shown below is a methodology that is rather simple and easy to explain to developers. The basic formula is the intersection's improvement project cost times the percent of new traffic the development will be adding to the intersection. For example, if a development will be adding 5% more traffic to an intersection, then that development should contribute 5% towards the cost of the intersection improvement.

The basic intersection formula to be used is as follows:

$TMP = (A / B) \times C$ where:

TMP = Traffic Mitigation Payment

A = Total proposal generated PM peak-hour trips entering the intersection (truck traffic should be converted to passenger car equivalents per the Highway Capacity Manual)

B = Acceptable intersection LOS volume at the deficiency threshold as calculated in the Highway Capacity Manual (see Section 4.1.06 LOS Threshold)[6]

C = WSDOT project cost (including design, right-of-way, and construction)

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[6] If the intersection is already failing or below the acceptable LOS threshold as specified in Section 4.1.06, the pre-development LOS shall be used.

Establishing the acceptable intersection LOS volume - Denominator B in the equation above - can be a complicated analysis. Intersection LOS is based on time delay: total delay for unsignalized intersections and delay for a single movement on signalized intersections. Therefore trip distribution is a critical factor on both types of intersections and signal phasing is critical on signalized intersections. Projection of background traffic in the horizon year is also a critical factor. This issue can be simplified by using the TIA's projection of total volumes entering the intersection in the horizon year for the Denominator B, rather than an idealized estimate of volumes at the threshold level of service, which could be a very subjective exercise. If the TIA is reasonable, this simplified estimate of traffic volumes is usually acceptable to both WSDOT and the developer.

The drawback to using a TIA's horizon year volume for a given development is that these volumes vary as other developments impact an intersection with their respective traffic projections and horizon years. Background and pipeline volumes change as well. However, a TIA's estimate of horizon year volumes is often the best estimate available and is usually acceptable for the purpose of determining a reasonable intersection traffic mitigation payment.

4.2.10   How to Calculate a Highway Corridor Traffic Mitigation Payment

Highway corridor traffic mitigation payments can be much more difficult to determine. The methodology to be used is similar to the intersection formula described in the previous section, but due to the variables involved, greater care must be used or the traffic mitigation payment may end up unrealistically high. This is because corridor projects are usually significantly more expensive than intersection projects. The terrain encountered, whether the project is in an urban or rural area, the amount of right-of-way needed, stormwater requirements, and the length of the project are just a few of the factors that can significantly increase the cost of the WSDOT project and subsequently the traffic mitigation payment request

As mentioned in previous sections, if the resulting mitigation payment is not reasonable and proportionate to the proposed land use project, then there is a significantly greater chance the request will be not supported by the SEPA lead agency or reduced or even denied by the Hearing Examiner. Therefore, on some bigger corridor projects it might be desirable to only use the estimated construction costs rather then including design, right-of-way, and construction cost.

The corridor formula derived below is also based on a few considerations. One of those considerations is that it be simple and easy to understand. If the developer, or even the local lead agency or the Hearing Examiner for that matter, can't understand the reasons for the mitigation request, then the likelihood of it being approved are drastically reduced.

Another is that the goal here is to collect an equitable contribution from a particular development that is fair to both WSDOT and the developer. As a result, the methodology below is not exact in that more precise numbers could be used that would undoubtedly increase the size of the traffic mitigation payment being requested. However, experience has shown that the more precise and exact the formula becomes, it increases the likelihood that the developer, the lead agency, and/or the Hearing Examiner will question the methodology.

As a result, the methodology below only uses through trips on the mainline state highway and does not count side street traffic that only crosses the state highway. It also uses the Highway Capacity Manual ideal conditions when determining the mainline Denominator B service flow rate. While most WSDOT projects would not obtain the ideal conditions service flow rate due to topography or traffic signals or access connections, the ideal

service flow rate allows for a better statewide consistency as well as simplicity. It also allows for an easier defense of the WSDOT request if the methodology can be shown to slightly favor the developer. Using numbers that slightly favor the development can go a long way toward the WSDOT ultimately obtaining the traffic mitigation payment request.

Each Region is responsible to determine which highway corridor projects they will request traffic mitigation payments for as well as how the baseline cost per trip is established.

The basic corridor formula to be used is as follows:

TMP = (A / B) x C where:

A = total proposal generated new PM peak hour trips both directions on a highway segment (truck traffic should be converted to passenger car equivalents per the Highway Capacity Manual).

B = applicable maximum service flow rate for all through lanes both directions for ideal conditions per the Highway Capacity Manual at the highways LOS deficiency threshold (see Section 4.1.06 LOS Threshold and Highway Capacity Manual Chapter 7, Table 7-1).

C = WSDOT project cost (usually including design, right-of-way, and construction).

When using this formula on a WSDOT highway project, it is usually desirable to break the cost down into highway segments. Since the traffic mitigation payment is based on the through movements only, major intersections that have significant turning volumes will make a good segment break. In addition, as mentioned in a previous section, the highway corridor traffic mitigation payment will be based on any segment that has 10 or more PM peak hour new trips in both directions. In addition, for any segment that has 10 or more trips, all trips are counted toward the mitigation calculation.

Listed below is an example of a highway corridor traffic mitigation payment determination:

The WSDOT has a 2.5-mile long corridor mobility project that will widen an existing two-lane highway to four through lanes with a two way left turn lane. The project is designed to have a 50-MPH speed limit when completed and is in an urban area with an estimated cost of:

Design = $1,000,000

Right-of-way = $5,000,000

Construction = $14,000,000

Total = $20,000,000

There are three major intersections along the route. The first major intersection is at the beginning of the project, the next major intersection is ¾ mile into the project, and the third major intersection is two miles into the project.

Based on the above information the project can be divided into three segments based on the three major intersections. Therefore the first segment to be used for determining a traffic mitigation payment is ¾ mile long, the second segment is 1¼ miles long, and third segment is ½ mile long. From the Traffic Impact Analysis prepared for the project, the proposal will add 25 new both direction through trips to the first segment, 30 to the second, and 40 new trips to the last segment.

From the Highway Capacity Manual for a 50 MPH highway the service flow rate per the Highway Capacity Manual Table 7-1 is 1670 vehicles per hour per lane. Since the project will result in four through lanes, the applicable "B" becomes 4 x 1670 or 6680 VPH. It should be noted as mentioned above that this figure could be reduced to include factors such as topography, land widths, signal spacing, etc, but for the sake of making this an easier request to defend in a Hearing the maximum service flow rate for ideal non-interrupted conditions is used.

Therefore, based on the above information the maximum cost per trip for the whole corridor project can be determine to be:

TMP = (A / B) x C where:

TMP = (1 trip / 4 x 1670 = 6680) x $20,000,000 = $2994 rounded to $3,000 per trip over the whole corridor.

Based on the above the maximum cost per trip over the whole corridor is $3,000. Actual costs per trip will ultimately be less since not all new trips travel the whole corridor. However, the main point to made here is that this is a reasonable request in most jurisdictions. Should the Region or the lead SEPA agency feel $3,000 is not a reasonable request, then maybe just the construction costs could be used to reduce cost per trip to a more acceptable figure on that particular region.

However, should $3,000 per trip be acceptable, then the ultimate traffic mitigation for this particular developer proposal would be:

TMP = (A / B) x C where:

Segment 1 - TMP = (A / B) x C = (25 / 6680) x (0.75 / 2.5 x $20,000,000) = $898 per trip rounded to $900 or 25 x $900 = $22,500

Segment 2 - TMP = (A / B) x C = (30 / 6680) x (1.25 / 2.5 x $20,000,000) = $1497 per trip rounded to $1500 or 30 x $1500 = $45,000

Segment 3 - TMP = (A / B) x C = (40 / 6680) x (0.50 / 2.5 x $20,000,000) = $598 per trip rounded to $600 or 40 x $600 = $24,000

Therefore the total traffic mitigation that will be requested from this particular development is $22,500 + $45,000 + $24,000 = $91,500 which when broken down by the maximum number of trips on any segment is $91,500 / 40 trips = $2,287 per trip.